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Report of the ninth session of the

ADVISORY COMMITTEE OF EXPERTS ON MARINE RESOURCES RESEARCH

Rome, 5-9 June 1978

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

REPORT OF THE NINTH SESSION

OF THE ADVISORY COMMITTEE OF EXPERTS ON MARINE RESOURCES RESEARCH

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PREPARATION OF THIS REPORT

This is the Report of the Ninth Session of the Advisory Committee of Experts on Marine Resources Research. Selected Working Papers from the session will be issued as a Supplement to this Report.

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I. GENERAL REPORT

1. PROCEDURAL MATTERS

Opening of the Session

1. The meeting was opened by the Chairman, Dr. D.L. Alverson. Mr. H. Watzinger, Assistant Director-General, Fisheries Department, then welcomed the members of the Committee and observers (listed in Appendix 1) on behalf of the Director-General of FAO.

2. In his address, which is set out in Appendix 2, Mr. Watzinger observed that the Committee was meeting during a period of rapid changes in fishery affairs throughout the world, which are having a major impact on FAO's activities in this field, and hence raise important issues on which FAO (and in some cases IOC) will need the advice of ACMRR. In the light of these developments, and in line with FAO policy, the composition of the Committee had been changed to broaden its representation and to assist it in taking full account of the interests of developing countries in its deliberations. He wished the Committee a successful meeting, the results of which would be considered the following week by the FAO Committee on Fisheries.

Adoption of the Agenda

3. The Agenda shown in Appendix 3 was adopted and rapporteurs were appointed for each of the major items.

2. LIVING RESOURCES OF THE SOUTHERN OCEAN

4. The Committee noted the information on recent activities concerning the Southern Oceans contained in ACMRR:9/78/4, and oral reports on the meetings of SCAR at Chamonix, and of the Group of Specialists at Kiel, which immediately preceded the ACMRR meeting.

5. The Committee particularly welcomed the agreement of SCAR that ACMRR should become a co-sponsor of the Group of Experts. This co-sponsorship has implications on membership. The Committee agreed with SCAR's proposal that the Group should be limited to about 12 members, plus some ex-officio participants. It proposed the Scientific Committee of IWC be invited to send an observer to the Group. The membership of the Group should be agreed as a whole between the sponsoring organizations, to ensure a comprehensive coverage of disciplines and a geographical balance. Members should not be considered as representing one or other sponsoring organization, but for the purposes of support of travel, etc., ACMRR should take responsibility for up to four members.

6. The Group has a task that would continue for at least the duration of BIOMASS, i.e. for a further ten years, and therefore, in accordance with the normal practice of most of the sponsoring bodies, there should be a regular rotation of membership, and of the convenorship, at intervals of about three years. The present convenor, Professor S.Z. El-Sayed, should continue in office until the end of 1978.

7. The Committee noted that the Group of Experts, in concentrating on the urgent problems of planning the BIOMASS programme had not been able to give much attention to item (c) of the terms of reference:

> "(c) To transmit through SCAR and SCOR to those countries engaged in the exploitation of the living resources of the Southern Ocean scientific information relevant to the management of such resources."

This matter is of particular interest to ACMRR, and its active pursuit was one of the main objectives of ACMRR in suggesting that it should become a co-sponsor of the Group.

8. The Committee recognized that decisions on practical measures concerning the utilization and management of Southern Ocean resources would, as for any other resources, have to be taken by the Governments concerned, individually or collectively. Equally, it recognized that the other co-sponsors of the Group of Experts did not wish to become directly involved in those practical issues. At the same time, if those decisions are to have the long-term effects desired by Governments, it is essential that they should be based on good scientific analyses of the state of the resources, and of the long-term effects on all major elements of the ecosystem, of different possible management actions.

9. The Committee therefore recommends that the Group should establish, within its approved structure, a small working party with the following terms of reference:

(a) to review the scientific principles relevant to the conservation of the living resources of the Southern Ocean;

(b) to consider what arrangements might be necessary to produce scientific advice adequate for effective resource management, with particular reference to the role of the Group of Specialists; and

(c) to propose scientific studies, including the collection of information from fisheries, needed as a basis for scientific advice.

10. The general outline of the BIOMASS programme, as described in the documents produced by the Group of Specialists, was endorsed, and in particular, it was agreed that studies of krill, its food, predators, and competitors, should form a central element of the programme.

11. The Committee urges that scientists from developing countries who have an interest in one or other aspect of the BIOMASS programme should be encouraged to take part in the research activities, either at sea, or at shore bases, and that the institutions carrying out these activities should offer facilities for this participation.

12. The Committee agreed with the conclusions of the Group of Specialists that the effective implementation of BIOMASS would require funding for a small central Secretariat, and for meetings and publications; it requests that FAO should respond positively to the decision of the Group (see Section 14 of its report) that:

> "(b) Appropriate international organizations such as FAO and IOC should be approached to see if they could help support the operation of a Secretariat, for example through contracts."

It was also suggested that UNEP, as an organization with direct interest in the conservation of living resources, should be approached for support.

13. It was noted that active negotiations were in progress to establish a convention for the Conservation of the Living Resources of the Southern Ocean. However, at the best, there would be an interim period of several years before such a convention came into force, during which time action might be desirable to ensure the management and conservation of resources (e.g. some fish stocks) not covered by existing arrangements. The Committee therefore strongly recommended that during this interim period the Group of Specialists should be prepared to provide scientific information and advice concerning the conservation of the Southern Ocean resources and should respond positively if requested by Governments to provide such advice.

3. PROBLEMS OF FISHERY RESEARCH IN DEVELOPING COUNTRIES

14. This item was introduced by Dr. Troadec, who reviewed four background documents (ACMRR 9/78/5, Inf. 5, 6 and 7). The Secretariat noted that following a recommendation by the Committee at its eighth session a preliminary assessment of the available information on the research resources of some developing countries was conducted. Although the significance of the indices used in the study was difficult to assess, some important conclusions were noted. In most developing countries the number of scientists was low in relation to their state of development and often their size. However, when related to factors such as population, GDP, fish production - which among other things should directly determine the research effort, the investments in scientists and equipment by some developing countries in the field of fishery research compare well with those observed in technologically-advanced countries. Since the research effort of developing countries is not likely to increase substantially in the near future, it is essential to make the best use of existing resources.

15. The weakness of fishery research in many developing countries has various causes, some immediate such as the lack of financial and human resources and others more closely related to the general state of development of each country. Indeed, the lack of scientific resources on the one hand, and on the other the poor use of existing research capabilities and results, the insufficiency of national research development policies, and the lack of communication between fishery research, administration, industry and other national institutions for marine science, are so closely related that it is difficult to distinguish the causes and effects. For example, it was noted that the existence of an effective government administrative machinery often is a pre-condition for the smooth development of fishery research.

16. The Committee noted that large differences in the level development of fishery research are observed between regions and even within regions, from one country to another, even when their economic wealth is comparable. The Committee, therefore, stressed it was essential to take full account of regional and national peculiarities when formulating training programmes and schemes for promoting research capabilities in general. It was recognized that although the main responsibility in terms of planning and financing, rests with the countries themselves, regional collaboration is invaluable in order to overcome the constraints already identified, and in particular the basic difficulty of achieving the required level of scientific work and of keeping abreast with developments in other countries and regions.

17. In carrying out periodic reviews of national research work in stock assessment, the advantages of regional or sub-regional groupings should be considered. This would give opportunities to provide scientific guidance, to exchange ideas and research findings and also to formulate ad hoc training activities in the various fields of fisheries research. In this respect, the Committee considered that one of its important tasks would be to contribute to the evaluation of scientific activities and the progress made in that field by the various FAO fishery bodies, including those undertaken with the support of the UNDP regional fishery projects.

18. In order to study more deeply the problems and opportunities that developing countries have in the area of fishery research, the Committee recommends that FAO establish, under ACMRR, a Working Party on the Promotion of Fishery Resources Research in Developing Countries, with the following terms of reference:

(i) Arrange for analyses to be made of a selection of development assistance projects in resources research, establishment of research institutions and various forms of training schemes and activities with a view to evaluating the efficiency and effectiveness of various approaches and policies.

(ii) Consider the main features of systems of organizing and planning fishery resource research with special emphasis on a full utilization of scarce facilities for research.

(iii) Consider institutional arrangements for international cooperation in research particularly within the framework of regional international organizations, e.g. fishery commissions.

(iv) Develop sets of strategies and tactics for development assistance in fishery research involving the transfer of technology, training and organization, and covering bilateral programmes between developed and developing countries, those of international organizations and cooperation between developing countries.

At the request of the Committee, Dr. A. Mena Millar agreed to serve as Chairman of this Working Party.

19. It was noted that because of the great variety and number of species which characterize tropical ecosystems, an approach different to the classic single-species methodology used for resource assessment in higher latitudes seems necessary in some tropical fisheries. This applies particularly to fisheries which exploit large numbers of species together in the same fishing areas. In such situations, the data collection and analysis tasks involved in assessing each species separately would be far beyond the capacity of the limited financial and manpower resources available.

20. The Committee recognized the need to examine carefully the adequacy of the existing concepts, models and methods used in stock assessment work as a basis for management, especially for tropical fisheries. Some aspects of these problems have already been noted and a review is given in the report recently prepared by the consultation organized by FAO in September 1977 on multi-species problems (FAO Technical Paper 181). Such work should lead to a better identification of the key data (basic fishery statistics, fish productivity indicators, etc.) that should, as first priority, be gathered for important tropical fisheries and to the formulation of guidelines for their analysis and interpretation.

4. METHODS OF DETERMINING ALLOWABLE CATCHES

21. Mr. Saetersdal introduced the topic by outlining the contents of his working paper (ACMRR:9/78/6), and the Secretariat outlined the other background paper (ACMRR:9/78/Inf.8). The value of the papers was stressed and the need to bring them to the attention of a wide audience was underlined. It was noted that the working paper had originally been prepared as a background paper for COFI.

22. The steps involved in establishing a management regime, as described in these papers, included the following:

(a) identification of the objectives to be pursued;

(b) determination, on the basis of the biological knowledge of the resource, the total allowable catch (TAC) that should be taken from the resource or the specific measures needed to achieve those objectives; and

(c) in the case of resources shared by more than one country, determination of the shares of the TAC that could be taken by each country.

23. In addition to scientific factors, management involves social, economic and other considerations, which were likely to vary, in their balance, from area to area and from time to time. ACMRR, as a scientific body, should not engage in the fruitless task of attempting

to determine some unique set of principles that might be followed in all circumstances. It could, however, assist in preparing a listing of scientific factors that might be taken into account in different circumstances, and the scientific implication of following one or other set of procedures.

24. Given some objective of management, e.g., attaining MSY or maintaining a certain critical level of spawning biomass, the TAC is determined on the basis of models of the dynamics of the resource. Certain reservations were noted concerning the models currently used in practice, which are mostly based on a simple, steady-state, single-species situation in temperate waters. To be useful in the situations facing fisheries now, and in the future, biological models should be able to take account of the ecosystem viewed as a whole (including the interaction between different exploited species), possible differences between temperate and tropical systems, and the importance of fluctuations, and transient effects, especially when they applied in economic analyses. Progress was being achieved in developing suitable multi-species and stochastic models, but this was perhaps barely adequate in the light of the demands of the new situation in resource management.

25. The underlying biological factors associated with the allocation of shares in a resource that occurs, and can be harvested, in more than one jurisdiction, have not from the scientific viewpoint been fully explored in recent discussions on the Law of the Sea. The establishment of an allowable catch by each country within its area of jurisdiction, was in accordance within the general principle of greater national self-determination, but could hamper resource management.

26. Any agreement on the allocation of an overall TAC is likely to be based on negotiations bringing in non-scientific - and quite possibly non-fishery - considerations. Nevertheless, these negotiations would be helped by having available relevant scientific information on the resource, e.g., the distribution of all life-stages and location of spawning areas. It was stressed that these should not be regarded as constant features, but could vary in accordance with, for example, trends in climatic conditions. There was, therefore, likely to be a considerable increase in the demands on scientists to supply the scientific information required for that purpose - a trend that was already a reality in the northeast Atlantic and elsewhere.

27. The Committee discussed ways in which it might act to deal with these questions. It stressed that there is a close interaction between scientific and other aspects of management. For example, in the case of shared stocks there are likely to be considerable problems of surveillance and inspection if one country is to be reassured that other countries are abiding by agreements on, for example, the shares of the TAC. These problems might well be reflected in doubts about the validity of reported statistics, and hence on the scientific assessments of the state of the stocks for which those statistics are essential. The Committee, therefore, believed that at least some of the scientific discussions of managment problems should be included in wider discussions, possibly at a forthcoming session of COFI, or at a separate symposium or similar meeting.

28. As contributions to such a widely-based discussion, a number of background papers should be prepared, e.g., critical reviews of the criteria used in setting allowable catches; conservation objectives; the general problems of shared stocks, including reviews of the importance of shared stocks in different parts of the world, etc. Some of these reviews could be prepared by the Secretariat, e.g., by using consultants, but in view of the complexity and importance of certain aspects, the Committee recommends that these should be handled by an ACMRR working group.

29. This Working Party on the Scientific Basis of Determining Management Measures should examine the new demands on scientific advice and analysis due to the greater range of objectives and the exploitation of a wider variety of species as well as questions

raised by the new regime of the sea, e.g., to what extent allocations of shared resources can be facilitated by scientific analyses.

30. It should have the following terms of reference:

(i) to review the concepts, principles and definitions used in resource conservation and management;

(ii) to examine the validity of existing biological models as applied to the new concepts of management, the range of species and ecosystems being exploited and economic models of resource management;

(iii) to develop new models as required;

(iv) to advise on the implications for research studies and for the data base that will be needed; and

(v) to examine special requirements for scientific advisory systems in the case of shared stocks.

The Committee agreed to ask Dr. B.J. Rothschild to serve as Chairman of this Working Party.

5. NEW ENVIRONMENTAL STUDIES RELEVANT TO FISHERY RESOURCES

31. The Committee took note of the increased worldwide activities concerned with the study of environmental changes and particularly of the World Climate Conference being organized by WMO in 1979. It believed that this Conference could be very relevant to fisheries and welcomed the inclusion of a paper specifically on fisheries. The choice of Dr. D.H. Cushing as author was very suitable and the Committee agreed with the general outline of his paper. It was felt that possibly more attention should be paid to changes in the distribution of fish stocks, rather than concentrating only on changes in abundance. Such studies were of special importance in connection with negotiations on the allocation of any total allowable catch between countries sharing the same resources, since changes in the environment might alter the proportion of such a stock that is available to one or other country.

32. Members of the Committee raised some specific points, and it was agreed that members should write directly to Dr. Cushing with suggestions on points that he could consider for possible inclusion in the paper. The ACMRR Secretariat should also supply Dr. Cushing with a list of specialists in the subject whom he might consult in its preparation. The Committee felt that to achieve the most effective discussion on fishery aspects, it would be essential for at least four or five fishery scientists to be present at the Conference. While the Committee recognized that decisions on attendance would be for Governments, it was recommended that the Chairman of ACMRR should send a letter to the Chairman of the organizing committee for the Conference setting out the importance of adequate attendance by fishery-minded scientists. This could also be used by ACMRR members in approaching their own Governments.

33. The Committee emphasized that the Conference was only one event in a continuing activity, and that the fishery science community, in addition to providing input to the Conference would need to maintain a continuing interest in the subject. ACMRR interests might, at least in part, be met by contacts with other organizations. For example, the Committee expressed the desirability of fishery scientists participating in the work of the SCOR Committee on Climatic Changes and the Ocean.

6. CONTRIBUTION OF BIOLOGICAL OCEANOGRAPHY TO FISHERY PREDICTION

34. The Committee took note of the Secretariat paper (ACMRR:9/78/8) setting out the broad fishery-directed problems for which studies in general biological oceanography would be valuable. It was agreed that this was a useful review of present problems, and with minor editing and further additions to be provided by IABO, should be widely distributed.

35. It was recognized that similar statements had been made before and that in the past progress in the topics identified as being of major importance had been slow. However, it was felt that in many respects advances in basic science and its application were now being made in these topics that should lead to a more productive interaction between biological oceanography and practical fishery investigations. A more intensive communication between scientists in these fields would facilitate the formulation of research projects in biological oceanography which are of direct relevance to fisheries.

36. Of the research topics considered in the working paper, it was felt that given recent advances in the technology of the direct detection and surveying of fish stocks, less attention need be given to questions of fish distribution, though tuna might be an exception.

37. As regards environmental control of recruitment, this was now being given high priority in many institutions. Quantitative studies on the early life stages of fish were giving improved insight into the processes involved, e.g., the match or mis-match of the time spawning, or greatest demand of larval fish for food, to the peak in the productive cycle. These matters, as well as predation on fish eggs and larvae, were to be discussed at a Symposium on the Early Life History of Fish, which ICES was organizing with the collaboration of FAO and other organizations, to be held in Woods Hole in April 1979. Further action by ACMRR should in general await the outcome of this Symposium.

38. As regards production and the food-web it is clear, e.g., from experience off the Indian west coast, that data on primary production alone may not provide a reliable estimate of the production of commercially harvestable fish. This might be expected on theoretical grounds, bearing in mind the big differences that are predicted if there is a change in the trophic level at which the harvest is taken, or in the transfer efficiency between trophic levels. In practice, differences in the trophic level of harvest do not seem to make the order of magnitude changes that are theoretically expected.

39. More needs to be known about this and two approaches were suggested. First would be a detailed study of a particular ecological system, preferably in a tropical area and one with a long series of historical fishery data, so that at least qualitative information on long-term fluctuations in fish stocks can be obtained. There should also be more detailed fishery data, at least for recent years, from which the current state of the stocks can be assessed. Second should be comparative studies of ecosystems. This in turn could be sub-divided into comparisons within groups of similar systems (coral reefs, coastal lagoons, etc.) in different areas, and comparison between these different groups, covering all regions from sub-arctic to the tropics. The former could lead to first, rough estimates of the potential yield from small unit resources based on simple indices, similar to those already developed for lakes and reservoirs.

40. In general, recent attempts at biological modelling of marine ecosystems and particularly of the upper parts of the food web will help to determine the potential exploitable production in different systems. Close collaboration between biological oceanographers and fishery scientists will be needed to come up with meaningful answers, useful for the development of complex, multispecies fisheries.

7. FUNCTIONS OF FAO REGIONAL BODIES

41. The Committee considered this item with particular reference to the scientific aspects of the regional bodies' functions. The Committee felt strongly that although fishery management decisions are now being made mostly by national authorities, regional fishery bodies are still essential in all parts of the world, particularly for scientific work. Common conservation measures are needed for shared stocks, which are very numerous, and for this purpose countries must cooperate in research, pool their data, carry out joint assessments and agree on the scientific basis of management. Even in the case of stocks that are not shared, the discussion of assessments and related research at regional scientific meetings, publicly reported, helps to maintain the quality of scientific work by promoting the exchange of information and advice among working scientists and, what is most important to science, by providing for a critical peer review of research methods and findings.

42. Regional scientific work can provide real benefits to participating countries, but only if they are all willing and able to pool the relevant data on their fisheries and research programmes within a regional structure. The Committee stressed that the provision of these data should be a fundamental obligation of membership in a regional body.

43. Regional fishery bodies can be particularly valuable in developing regions because they can:

(i) serve to assemble a sufficient number of scientists (i.e. the critical mass) for lively and productive review and collaboration in regions where many countries have only a few scientists each;

(ii) arrange training programmes suited to the region's specific needs and stage of development;

(iii) coordinate technical cooperation among developing countries, i.e. the sharing among countries of particular national skills or facilities; and

(iv) with financial support from member countries or other sources, provide for the entire region specialized technical services that individual countries cannot afford (e.g., a well-equipped research vessel, computer facilities, highly trained scientists or technicians).

44. In recent years, FAO regional projects have been supporting such activities of the FAO regional bodies (e.g., CECAF, WECAFC, IPFC) with considerable success. But as is stressed elsewhere in this report, the development of national research capabilities requires the determination and support of governments for a long period, and this applies to the part that can be played by regional bodies as well as to national programmes. In the long run, therefore, the success of regional bodies will depend on the will and the efforts of the member countries themselves. Among other things, effective participation will require that each country establish adequate coordination and communication among its national fishery institutions (i.e. in research, administration, statistics). And most important, as is true in every region, it will require that each country collect and submit the basic data on its fisheries.

45. The interests of all regional bodies are not necessarily the same. In developed regions they will tend to cover a wide range of disciplines and engage in basic as well as applied science, while in developing regions they will be concerned mostly with resource investigations of direct practical importance. In view of these differences, and other factors that define the common interests of a regional body (e.g., other things being equal a scientific body could profitably cover a much larger area than one concerned with management), the Committee believed that it would be useful to review the activities and functioning of existing regional bodies to see if a reorganization along geographic, functional or other lines could inrease their effectiveness.

46. On the basis of its discussion, the Committee recommended:

that the Secretariat review and up-date the advice on regional bodies given by ACMRR at its seventh session in the light of recent changes in fishery jurisdiction and prospective arrangements for fishery management and related matters as set out in the pertinent articles of the UNCLOS text.

8. ESTABLISHMENT OF AN ADVISORY PANEL ON AQUACULTURE

47. Professor Tiews introduced document ACMRR:9/78/10, which contained a proposal for the establishment of an Advisory Panel on Aquaculture put forward by the FAO Technical Conference on Aquaculture held in Kyoto, Japan, in mid-1976. He reviewed the activities of ACMRR and other bodies in the field of aquaculture, noting the Committee's formation of a Working Party on Aquaculture at its sixth session. The role of the Committee in calling the Kyoto Conference was also recalled. The needs for assistance to the scientific community in identifying critical areas of research, and for developing more uniform ways of communicating the results of research in such areas as fish nutrition, were identified as activities which could be effectively promoted through the formation of such an advisory group.

48. The Committee was informed of the progress in establishing regional centres for aquaculture research and training in Africa, Asia and Latin America, through the activities of the FAO/UNDP Aquaculture Development and Coordination Programme.

49. The Committee emphasized the growing importance of aquaculture and the need for FAO's activities in this field to be further strengthened. It also noted the rapid development that has occurred in this field since ACMRR first recognized its potential importance. In this time, the work, both in research and application, has become greatly diversified. It was further noted that special efforts may now be needed to assure a more effective distribution of information on aquaculture research and practice to all countries, and better coordination among regional activities.

50. Noting that the diversity of requirements and expertise needed to address the wide variety of problems of the science of aquaculture could not easily be assembled in a group of reasonable size, the Committee agreed that ACMRR should re-activate the Working Party on Aquaculture with revised membership and terms of reference, to assist FAO, both in its Regular and Aquaculture Development and Coordination Programmes, and in particular to assist the Secretariat in arranging special activities by appropriately selected specialists, as required, to meet specific problems. Membership and terms of reference should be determined by correspondence and finally approved by the officers.

9. WORKING PARTIES

Marine Mammals

51. Dr. Laws introduced the Report of the Working Party which had been published as FAO Fisheries Report 194 in October 1977. The Working Party had drawn on the Reports of the four ad hoc Working Groups and on the Reports from 25 Working Groups set up during the Scientific Consultation held in Bergen in September 1976; but he emphasized that the final report represented the views of the Working Party. He indicated that the Consultation had been a unique undertaking which brought together some 200 specialists covering a wide spectrum of interests from those of the whaling industry to those of dedicated environmentalist groups. Potentially the subject dealt with was a highly emotive one but the deliberations of the Consultation and the Working Party had been a genuine attempt to understand differing viewpoints and to contribute to a common aim.

52. The Committee agreed that the Working Party on Marine Mammals had been one of the most important activities of ACMRR, and accepted its report. The Committee expressed its appreciation of the work of the many scientists who have participated in the Working Party's activities and asked the Chairman to write to the key people involved to convey its thanks. It also expressed its gratitude for the financial and other support provided by the United Nations Environment Programme, the International Union for the Conservation of Nature, the World Wildlife Fund, and the Governments of Australia, Canada, Norway and the United States of America. The Committee stressed the need for prompt publication of the Proceedings of the Scientific Consultation.

53. The Report of the Working Party considers the status of species and populations, the role of mammals in marine ecosystems, the effects on them of human activities and their effects on humans. Conservation and management of marine mammals and their environment involve questions of scientific advice and the consequences of error, management objectives, and the theory and practice of management. Future trends in the impacts on marine mammals and in the demand for their products are identified in the Report. An important discussion is concerned with our appraisal of present and future management actions related to whales.

54. A major task of the Working Party and the Scientific Consultation was the identification of significant gaps and weaknesses in past and current research programmes. The Working Party had recommended high priority areas for research, proposed a framework for its organization and rated the categories of research, by taxonomic grouping, as feasible in short-, medium-, or long-term, considering the availability of essential biological information and logistic requirements. This was an approach that might be taken in evaluating specific research proposals related to different objectives.

55. Perhaps the most important general conclusion was the need to focus research on marine mammals and especially their relation to and effects on other elements of the ecosystems of which they are part. There is a need for multispecies modelling; the data base is very inadequate and an intensive and extensive research effort is needed.

56. Of the Working Party's specific recommendations, several are essentially administrative in nature. On substantive matters:

Recommendation 1 concerns objectives for conservation and management and should be brought to the attention of FAO, UNEP and the other bodies suggested.

Recommendation 2, dealing with threatened or endangered species, should be taken up but is not a prime concern of FAO.

Recommendation 4 concerns the need for independent monitoring of scientific advice given to international management bodies and also the monitoring of the application of this advice.

Recommendation 6 deals with the implementation of the proposed research programme and the possible creation of an International Fund for Marine Mammal Research and Conservation.

Recommendation 7 welcomes the initiative of the IWC in planning the International Decade of Cetacean Research and recommends that FAO encourage financial support for certain of these projects.

Recommendation 8 is concerned with the need for FAO and UNEP to act to ensure continuation of the initiative represented by the task given to the Working Party, by the Scientific Consultation and the FAO/UNEP Marine Mammal Project.

Recommendation 11 relates to the publication of the Report and its Annexes, and also of a shorter, less technical version.

57. The Committee was informed of the important developments that have taken place since the last meeting of the Working Party. UNEP has decided to act on Recommendation 8 by funding a continuation of the development of a marine mammal research programme, of which a first draft was prepared by the Working Party. This programme would include management and conservation activities. IUCN has also taken important initiatives in the light of the Working Party report. In addition to setting up an Interim Committee on Marine Mammals which has formed a Working Group of Experts to consider the structures and arrangements which may be needed to ensure the coordination of management measures by different specialized bodies, the activities of IUCN also include the sponsoring of two studies relating to the utilization of the living marine resources of the Southern Ocean. Several non-governmental sources of funding have become available for marine mammal research. Improved funding is bringing an increasing number of specialists into this field of research. This in turn is leading to broadening the expertise at the meetings of the Scientific Committee of the Whaling Commission. The studies of that Committee have recently led to substantial changes in the whale assessments, which imply a need for smaller quotas for nearly all stocks.

58. In accepting the Working Party's Report and its recommendations, the Committee considered that the Working Party had completed its important task and could accordingly be disbanded. It was, however, of major importance that ACMRR should keep closely in touch with the various follow-up actions. The Committee agreed that its Chairman should undertake this liaison function with the assistance of Dr. Laws. Attention was drawn in particular to Recommendation 6 concerning arrangements for international cooperative research. It was recognized that four or five organizations would be involved in this matter. ACMRR recommends that FAO ask UNEP to organize a consultation between the interested organizations in which ACMRR would wish to participate through its Chairman.

59. The Committee recalled that in deciding to set up the Working Party on Marine Mammals, it was aware that it was taking up a topic on which there was considerable controversy, scientifically and with respect to policy, in several countries. Nevertheless, this exercise had been highly successful and indeed had contributed in removing some of the uncertainties and misunderstandings which were generating conflict. This should be an encouragement for the Committee not to refrain from consideration of other controversial matters in future where an independent, visibly neutral, scientific analysis could be helpful. The Committee considered it important that COFI should be informed of its views on this important matter.

Reports from other Working Parties

60. Under this item, the Secretary of ACMRR reviewed the status of working parties (other than those on Marine Mammals and Aquaculture, discussed above) and their activities since the last session (document ACMRR:9/78/11) for consideration by the members.

(i) Working Party on Fishing Effort and the Monitoring of Fish Stock Abundance

61. With support from UNEP, this Group held a meeting in 1975 and has produced two technical papers, completing its work. It was therefore disbanded by the Committee.

(ii) Ad hoc Group of Experts on the Facilitation of Acoustic Research in Fisheries

62. After working entirely by correspondence for several years, this group arranged a very useful meeting in 1977 on methods of measuring the target strength of fish. The Committee recommended to FAO that the group should continue with Mr. Parrish as Convenor in its role as a liaison among researchers in different countries and should have the opportunity to hold occasional meetings of small groups of experts on specific technical problems as necessary.

(iii) Working Party on Goals and Objectives

63. The Secretariat had produced and circulated a discussion paper on fishery management in preparation for this working party, but the members had not been appointed. Since the broad terms of reference of the newly established Working Party on the Scientific Basis of Determining Management Measures include goals and objectives, the Committee decided to terminate the older working party.

New Working Parties

64. At this session, ACMRR recommended a Working Party on Promotion of Fishery Research in Developing Countries and a Working Party on the Scientific Basis of Fishery Management.

Co-sponsorship

65. In conjunction with SCOR, SCAR and IABO, ACMRR will co-sponsor and participate in the Group of Specialists on the Living Resources of the Southern Ocean. The Committee also decided to co-sponsor the SCOR Working Group on Estimation of Micro-Nekton Abundance (WG 52), as well as continuing its association with the SCOR Working Group on River Inputs to Ocean Systems (WG 46).

Other groups of interest to ACMRR

66. Some other SCOR groups are engaged in work that the Committee will follow with interest while not participating directly, namely:

(i) SCOR WG 59 (Mathematical Models in Biological Oceanography)

(ii) SCOR WG 60 (Mangrove Ecosystems)

(iii) SCOR Committee on Climatic Changes and the Ocean.

10. MATTERS REFERRED TO ACMRR BY THE INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC)

67. Mr. D.P.D. Scott, Secretary of IOC, reviewed several activities of common interest (document ACMRR:9/78/12) for comment by ACMRR including:

(i) Investigations of the El Niño phenomenon

68. The Committee recommended that these programmes, sponsored by various international organizations, in addition to physical measurements, should involve biological studies aimed at explaining the variable effects of El Niño on the ecosystem in general and important fish stocks in particular. Without this understanding, the ability to predict the phenomenon will be of little direct benefit to fisheries.

(ii) Monitoring background levels of selected pollutants in open oceans

69. The Committee was invited to undertake a review of the physiological pathways by which the main pollutants are accumulated in certain marine organisms, but it felt that this problem could be handled best by GESAMP. As a general principle, the members thought that ACMRR should limit its activity in this area to cases where toxic effects of pollutants or metabolic products actually interfered with the productivity or utilization of living marine resources.

(iii) Studies of the Southern Oceans

70. This topic had been discussed previously (pp. 1-2).

(iv) Research programmes of the IOC Association for the Caribbean and Adjacent Regions (IOCARIBE)

71. The Committee was pleased to hear of the basic scientific studies in support of fisheries undertaken by IOCARIBE in consultation with WECAFC and the FAO/UNDP regional project, and it instructed the Secretariat to keep it informed of the progress of this cooperative work.

(v) Future of IOC

72. The Committee was informed of developments in IOC with respect to its future role and functions. The first session of the IOC Working Group on the Future Role and Functions of the Commission will take place in Rome from 12-15 June 1978. The Committee was specifically requested, as an advisory body of IOC, to comment and formulate advice on this issue.

73. In view of the short time available, the Committee decided, as an immediate action, to request Mr. E.F. Akyüz of the FAO Secretariat to follow, on behalf of ACMRR, the above-mentioned session and to express the Committee's view that IOC, being a joint specialized mechanism of those UN organizations which are members of ICSPRO, should undertake required coordination functions and should avoid duplicating activities that fall under the mandate of these bodies.

74. The Committee also expressed the wish that those ACMRR members (Basulto, Bogdanov, Odero, Parrish, Ruivo) present in Rome at the time of the first session of the above-mentioned IOC Working Group participate in its activities as far as their time permits.

75. In view of the importance of that issue to marine science and its applications, including to fisheries, which calls for further study and consideration, the Committee decided to approach the other advisory bodies of IOC with a suggestion that a consultation be held at an early date among experts representing the interests of the different bodies to provide the required input to the IOC Working Group on the Future Role and Functions of the Commission at its second session, which is scheduled for December 1978.

76. The Committee recommends that the following points be used as a basis for the negotiation of the final terms of reference with other co-sponsors of the Consultation:

(a) to appraise the likely nature of international marine science activities that will be required over the next few decades and determine how they can best be promoted and supported within the United Nations system as a whole, taking into account the prospective results of UNCLOS; and

(b) within this framework, to recommend what should be the role and functions of IOC to make its work most effective.

The Secretary of IOC was requested to investigate arrangements and support for the consultation.

11. OTHER MATTERS

Contacts between FAO Staff and other Fishery Biologists

77. Taking a broad view of the role of FAO in marine resources research, the Committee pointed out that FAO scientific staff must make constant efforts to keep abreast of progress and problems in fishery research throughout the world. The most effective way for FAO staff to keep track of other scientists (especially young scientists) and their work is by regular attendance at scientific meetings, particularly international ones.

78. It is also essential for FAO to keep scientists elsewhere informed of its activities, services and needs. FAO publications in fishery science are generally of good quality and very useful for this purpose, but they should be better publicized, more widely distributed and more easily obtainable on order than they are now. Other ways of familiarizing scientists with the work of FAO would be for FAO staff to lecture occasionally at universities and research institutes and to arrange short-term fellowships at FAO for junior scientists.

Election of Officers

79. In recognition of their excellent leadership and broad experience, the Committee unanimously requested the present officers to continue their duties during what promised to be an active and important period in the work of ACMRR. Despite other heavy commitments in all cases, Drs. Alverson, Tiews and Mena agreed to do so.

Time and place of next meeting

80. It was agreed that the time of the next meeting would be decided by consultation among the officers, who will consider the possibility of holding the meeting in a developing country.

Sources of support for ACMRR activities

81. The Chairman observed that FAO funds available for the work of ACMRR are limited and called particularly on members from developed countries to look into possible national funding of specific activities such as working party meetings.

II. APPENDIXES

APPENDIX 1

LIST OF PARTICIPANTS

Members of ACMRR

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M. Lizarraga	La Directora General de Acuacultura Departamento de Pesca Mexico City D.F. Mexico
A. Mena Millar (Second Vice-Chairman)	Director Ciencia y Técnica Ministerio de la Industria Pesquera La Habana Cuba
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M. Ruivo	Director General (attached to the Cabinet of the Minister of Agriculture and Fisheries) Praça Duque Terceira 24/2/DRT Lisbon Portugal
G. Saetersdal	Director Institute of Marine Research Nordnesparken 2 Bergen Norway
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IOC

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Representatives and Observers of International Organizations (cont.)

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Chairman, ACMRR Working Party on Marine Mammals

R.M. Laws	Director British Antarctic Survey Madingley Road Cambridge CB3 OET United Kingdom

Food and Agriculture Organization

H. Kasahara	Director, Fishery Resources and Environment Division
J.A. Gulland	Chief, Marine Resources Service Fishery Resources and Environment Division
H.F. Henderson	Chief, Inland Water Resources and Aquaculture Service Fishery Resources and Environment Division
W. Clark	Fishery Resources Officer Marine Resources Service Fishery Resources and Environment Division

Secretariat of the Committee

Secretary	Dr. H. Kasahara
Secretarial assistants	Mrs. J.C. Webb Mrs. J. Valletta

APPENDIX 2

OPENING SPEECH BY MR. H. WATZINGER, ASSISTANT DIRECTOR-GENERAL, FISHERIES DEPARTMENT

Mr. Chairman, Distinguished Members of the Committee and Observers,

It is my pleasure to welcome you, on behalf of the Director-General, to the Ninth Session of the Advisory Committee on Marine Resources Research.

I am sure all of you are aware that the Committee, established in 1962, is charged with the task of advising the Director-General of FAO on the formulation and implementation of FAO's programme concerned with research on marine fishery resources, as well as fisheries aspects of oceanographic research. In the latter context, it is also an advisory body to the Intergovernmental Oceanographic Commission (IOC).

FAO attaches special importance to the current session of the Committee for we are now in a period of rapid transition in the utilization of marine resources. Emphasis on research activities is also shifting. In this general framework, I wish to urge the Committee to give special attention to certain problems arising from the consequent shifts of emphasis in FAO's programme and also from the emerging new regime of the sea.

You will be discussing the problems of fishery research of special interest to developing countries, including both technical issues and the promotion and organization of research. This is in conformity with the general policy of FAO to assist developing countries in their efforts to achieve a greater degree of self-reliance.

Such a discussion naturally leads to a related subject, i.e. the principles of determining allowable catches, especially for resources shared by two or more states. With the extension of national jurisdiction over fishery resources up to 200 miles, shared resources will constitute the majority of the fish stocks of the types now exploited. Allocation of such resources is basically a political problem, but success, in the sense of sustainable use, realization of values, and avoidance of conflicts, requires greatly improved knowledge of the biological characteristics of the species or stocks in question and of the environments they inhabit. Article 63 of the Informal Composite Negotiating Text dealing with stocks occurring within the EEZ's of two or more coastal states or both within the EEZ and an area adjacent to it, simply calls for coordination among the states concerned. This leaves open a number of scientific and administrative problems. Negotiations now being carried out for the allocation of shared resources indicate the complexity of the problems involved and inadequacy of existing scientific information to cope with them.

Several topics to be discussed at this session relate to new environmental studies relevant to fishery resources and contributions of biological oceanography to fishery prediction. These questions are of great importance from the point of view of fishery research and resources management. Short-term, medium-term and long-term changes in the abundance of fishery resources have long been recognized, but little is known of the specific factors contributing to such changes, whether they be trends or fluctuations. There has been increased interest in biological oceanography in connection with violent year to year fluctuations in the recruitment of many stocks. Here again the mechanisms through which such fluctuations occur are not understood in most cases. The Committee is requested to advise on the ways in which fishery scientists can take advantage of various environmental and oceanographic studies that might be relevant to the question. The subject is, of course, also of great interest to WMO and IOC. The former organization, with FAO, is concerned about the effects of climatic changes on food supplies, and any advice ACMRR can give on this matter, as it concerns the ocean would be welcome at this time.

Another topic of importance concerns the functions of FAO regional fisheries bodies.

Various regional bodies are currently re-examining their functions, and both the Director-General and our governing organs are re-examining the functions of bodies established under the FAO constitution. ACMRR is requested to advise on a set of principles and guidelines, on the basis of which the scientific and development work, of the regional bodies should in future be carried out.

Lastly, the agenda for this session includes the "Living Resources of the Southern Ocean". The BIOMASS (Biological Investigations of Marine Antarctic Systems and Stocks) Programme developed by the SCAR/SCOR Group of Specialists, with the participation of FAO, is being discussed in various fora. The most recent meeting of this Group was held last week in Kiel. ACMRR's advice is sought on the topics, within the overall framework of the BIOMASS programme, which require priority attention from FAO's point of view and any modifications that are needed to the administrative arrangements.

As you have a tight schedule, I will refrain from going into further details of these and other topics listed in the provisional agenda. I expect that the substance of your discussion will be conveyed to the session of the Committee on Fisheries to be held next week.

I wish you a very successful meeting and hope you will have time to enjoy your stay in Rome.

APPENDIX 3

AGENDA

1. Opening of the session
2. Adoption of the agenda
3. Living resources of the Southern Ocean
4. Problems of fishery research in developing countries
5. Methods of determining allowable catches
6. New environmental studies relevant to fishery resources
7. Contribution of biological oceanography to fishery prediction
8. Functions of FAO regional bodies
9. Establishment of an Advisory Panel on Aquaculture
10. Working Parties
    - (a) Marine Mammals
    - (b) Reports from other Working Parties
    - (c) Future activities of Working Parties
11. Other matters referred to ACMRR by the Director-General of FAO
12. Matters referred to ACMRR by the Intergovernmental Oceanographic Commission (IOC)
13. Election of Officers
14. Any other business
15. Adoption of the report

APPENDIX 4

LIST OF DOCUMENTS

ACMRR:9/78/1	Provisional agenda
2	Provisional annotated agenda
3	Provisional timetable
4	Recent Southern Ocean activities
5	Research requirements in developing countries
6	Principles of determining allowable catches with particular reference to shared resources
7	Recent advances in the study of environmental variability and their relevance to fisheries
8	Problems and progress in biological oceanography relevant to fisheries
9	The scientific work of regional bodies
10	Promotion of aquaculture research and development through the establishment of an Advisory Panel on Aquaculture
11	Brief review of working party progress
12	Matters referred to ACMRR by the Intergovernmental Oceanographic Commission (IOC)
12 Sup.1	Report of the Second Session of the IOC/WMO Sub-Group of Experts on the Integrated Global Ocean Station System (IGOSS) Products of Interest to Fisheries, Hamburg, 28 February - 2 March 1978
12, Sup.2	Intergovernmental Oceanographic Commission Circular Letter No. 693 dated 30 January 1978: Future Role and Functions of the Intergovernmental Oceanographic Commission
12, Sup.3	Summary Report and Recommendations of the two sessions of the Intergovernmental Oceanographic Commission Scientific Advisory Board held at UN Headquarters, New York, 12-16 July 1976 (SAB-I) and Unesco Headquarters, Paris, 12-16 April 1977 (SAB-II) (IOC/SAB-II/3)
12, Sup.4	- Not issued -

ACMRR:9/78/Inf.1	List of documents
Inf.2	List of Members of the FAO Advisory Committee of Experts on Marine Resources Research
Inf.3	Information for participants
Inf.4	Biological Investigations of Marine Antarctic Systems and Stocks (BIOMASS), Volume 1: Research Proposals, Prepared by Scientific Committee on Antarctic Research (SCAR) Scientific Committee on Oceanic Research (SCOR) Group of Specialists on Living Resources of the Southern Ocean. SCOR Working Group 54
Inf.4, Sup.1	Intergovernmental Oceanographic Commission paper IOC/INF-337 Biological Investigations of Marine Antarctic Systems and Stocks (BIOMASS) Summary of Objectives and Programmes Prepared by SCAR/SCOR Group of Specialists on the Living Resources of the Southern Ocean. SCOR Working Group 54
Inf.5	A comparison of national resources available for fishery research (FIRD/C348)
Inf.6	Problems of fishery research in Latin America
Inf.7	Application of science and technology in the development of fisheries
Inf.8	Principles and problems in determining allowable catches
Inf.9	Monitoring of Fish Stock Abundance: The Use of Catch and Effort Data (a report of the ACMRR Working Party on Fishing Effort and Monitoring of Fish Stock Abundance) (FIRS/T155)
Inf.10	Report of the ACMRR Working Party on Marine Mammals (FIR/R194)
Inf.11	Reports of the ACMRR/IABO Working Party on Biological Effects of Pollutants and the ACMRR/IABO Expert Consultation on Bioassays with Aquatic Organisms in relation to Pollution Problems (FIR/R187)
Inf.12	Manual of Methods in Aquatic Environment Research Part 2 - Guidelines for the Use of Biological Accumulators in Marine Pollution Monitoring (a manual of the ACMRR Working Party on Biological Accumulators (FIRI/T150)
Inf.13	Manual of Methods in Aquatic Environment Research Part 4 - Bases for Selecting Biological Tests to Evaluate Marine Pollution (a manual of the ACMRR/IABO Working Party on Biological Effects of Pollutants (FIRI/T164)
Inf.14	Report of the ACMRR ad hoc Group of Experts on the Facilitation of Acoustics Research in Fisheries
Inf.15	Scientific Committee on Oceanic Research: Proceedings, Volume 13
Inf.16	Report of the Eighth Session of ACMRR, Sesimbra, Portugal 8-12 September 1975 (FIR/R171)

APPENDIX 5

LIST OF ACRONYMS USED IN REPORT

ACMRR	Advisory Committee of Experts on Marine Resources Research
BIOMASS	Biological Investigations of Marine Antarctic Systems and Stocks
CECAF	Fishery Committee for the Eastern Central Atlantic, FAO
COFI	Committee on Fisheries
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Pollution, IMCO/FAO/Unesco/WMO/WHO/IAEA/UN
IABO	International Association of Biological Oceanography
ICES	International Council for the Exploration of the Sea
ICSPRO	Inter-Secretariat Committee on Scientific Programmes Relating to Oceanography, UN/Unesco/WMO/FAO/IMCO/IOC
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Association for the Caribbean and Adjacent Regions
IPFC	Indo-Pacific Fisheries Council, FAO
IUCN	International Union for Conservation of Nature and Natural Resources
IWC	International Whaling Commission
SCAR	Scientific Committee on Antarctic Research
SCOR	Scientific Committee on Oceanic Research
UNCLOS	United Nations Conference on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
Unesco	United Nations Educational Scientific and Cultural Organization
WECAFC	Western Central Atlantic Fishery Commission
WMO	World Meteorological Organization

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